

Listing of Claims

The following listing of claims replaces all previous listings. The listing of claims is as follows:

1. (Previously presented) A multiple port unit adapted for coupling one or more computers to multiple peripheral devices over a network, said multiple port unit comprising:
 plural network ports, each of said network ports being configured to couple the multiple port unit to a computer over a respective network link;
 plural communication serial ports, each of said communication serial ports being configured to couple the multiple port unit to a peripheral device; and
 a control unit to interrogate the network links and to communicatively couple said communication serial ports to a selected one of said network ports based on the interrogation of the network links, the control unit further determining whether it is time to interrogate the network links.
2. (Previously Presented) A multiple port unit as recited in claim 1, wherein said network ports are configured to couple the multiple port unit to plural computers and wherein said control unit is configured to interrogate each of the plural the-computers and to select an active computer to control the peripheral devices based on the interrogation of the computers.
3. (Original) A multiple port unit as recited in claim 2, wherein said control unit interrogates the computers over each of the network links in an alternating manner.
4. (Original) A multiple port unit as recited in claim 3, wherein said network ports comprise Ethernet ports.
5. (Previously presented) A multiple port unit as recited in claim 4, wherein said communication serial ports comprise serial ports.

6. (Original) A multiple port unit as recited in claim 4, further comprising two redundant power supplies.

7. (Original) A multiple port unit as recited in claim 1, wherein said control unit is configured to interrogate the network links using a network carrier signal.

8. (Original) A multiple port unit as recited in claim 2, wherein said control unit is configured to interrogate the computers using Packet Internet Groper.

9. (Original) A multiple port unit as recited in claim 2, comprising two network ports and 8 communications ports.

10. (Previously presented) A multiple port unit as recited in claim 2, further comprising a data bus coupled to said control unit, said network ports and said communication serial ports.

11. (Previously presented) A computer architecture comprising:

plural computers;

plural peripheral devices; and

a multiple port unit having plural network ports, plural communication serial ports, and a control unit, each of said network ports being coupled to one of said plural computers over a respective network link, each of said communication serial ports being coupled to a peripheral device, said control unit interrogating the network links and communicatively coupling said communication serial ports to a selected one of said network ports based on the interrogation of the network links.

12. (Previously presented) A computer architecture as recited in claim 11, wherein said control unit is configured to interrogate each of the plural computers and to control the peripheral devices based on the interrogation of the computers.

13. (Original) A computer architecture as recited in claim 12, wherein said control unit interrogates the computers over each of the network links in an alternating manner.

14. (Original) A computer architecture as recited in claim 13, wherein said network ports comprise Ethernet ports.

15. (Previously presented) A computer architecture as recited in claim 14, wherein said communication serial ports comprise serial interfaces.

16. (Original) A computer architecture as recited in claim 14, further comprising two redundant power supplies.

17. (Original) A computer architecture as recited in claim 11, wherein said control unit is configured to interrogate said network links using a network carrier signal.

18. (Original) A computer architecture as recited in claim 12, wherein said control unit is configured to interrogate said computers using Packet Internet Groper.

19. (Original) A computer architecture as recited in claim 12, comprising two network ports and 8 communications ports.

20. (Original) A computer architecture as recited in claim 12, wherein said peripheral devices are intelligent electronic devices.

21. (Original) A computer architecture as recited in claim 20, wherein said intelligent electronic devices are protective relays.

22. (Previously Presented) A multiple port unit adapted for coupling one or more computers to multiple intelligent electronic devices over a network, said multiple port unit comprising:

two Ethernet ports, each of said Ethernet ports being configured to couple the multiple port unit to a computer over a respective Ethernet link;

plural serial ports, each of said serial ports being configured to couple the multiple port unit to an intelligent electronic device; and

a control unit to interrogate the Ethernet links and to communicatively couple said serial ports to a selected one of said Ethernet ports based on the interrogation of the Ethernet links, the control unit further determining whether it is time to interrogate the Ethernet links the interrogation of the Ethernet links including:

the control unit sending out a packet. and

the control unit then waiting for a reply, in response to the sent packet.

23. (Original) A multiple port unit as recited in claim 22, wherein said control unit is configured to interrogate each of the plural the computers and to designate a selected one of the computers as an active computer to control the intelligent electronic devices based on the interrogation of the computers.

24. (Original) A multiple port unit as recited in claim 23, wherein said control unit interrogates the computers over each of the Ethernet links in an alternating manner.

25. (Original) A multiple port unit as recited in claim 24, further comprising two redundant power supplies.

26. (Original) A multiple port unit as recited in claim 22, wherein said control unit is configured to interrogate the Ethernet links using an Ethernet carrier signal.

27. (Original) A multiple port unit as recited in claim 23, wherein said control unit is configured to interrogate the computers using Packet Internet Groper.

28. (Original) A multiple port unit as recited in claim 23, comprising 8 serial ports.

29. (Original) A multiple port unit as recited in claim 22, further comprising a data bus coupled to said control unit, said Ethernet ports, and said serial ports.

30. (Previously Presented) A multiple port unit adapted for coupling one or more computers to multiple peripheral devices over a network, said multiple port unit comprising:

plural network ports, each of said network ports being configured to couple the multiple port unit to a computer over a respective network link;

plural communication serial ports, each of said communication serial ports being configured to couple the multiple port unit to a peripheral device; and

control means for interrogating the network links and communicatively coupling said communication serial ports to a selected one of said network ports based on the interrogation of the network links; and

wherein said control means interrogates plural computers over each of the network links in an alternating manner.

31. (Previously presented) A multiple port unit as recited in claim 30, wherein said network ports are configured to couple the multiple port unit to the plural computers and wherein said control means comprises computer interrogating means for interrogating each of the plural computers and designating a selected one of the computers as an active computer to control the peripheral devices based on the interrogation of the computers.

32. (Canceled).

33. (Previously presented) A multiple port unit as recited in claim 31, wherein said network communication serial ports comprise Ethernet ports.

34. (Previously presented) A multiple port unit as recited in claim 33, wherein said communication serial ports comprise serial ports.

35. (Original) A multiple port unit as recited in claim 33, further comprising two redundant power supplies.

36. (Original) A multiple port unit as recited in claim 30, wherein said control means comprises means for detecting a network carrier signal.

37. (Original) A multiple port unit as recited in claim 31, wherein said computer interrogation means comprises Packet Internet Groper.

38. (Previously presented) A multiple port unit as recited in claim 30, further comprising a data bus coupled to said control means, said network ports and said serial communication ports.

39. (Original) A multiple port unit as recited in claim 31, comprising two network ports and 8 communication ports.

40. (Previously presented) A method of coupling plural peripheral devices to computers, said method comprising the steps of:
interrogating the status of plural network connections with a control unit of a multiple port unit having plural network ports coupled to the plural network connections and plural communication serial ports coupled to peripheral devices, the control unit determining whether it is time to interrogate prior to performing the interrogation; and
coupling the plural communication serial ports to one of the network connections based on the results of said step of interrogating the status of plural network connections.

41. (Original) A method as recited in claim 40 further comprising the steps of
interrogating the status of plural computers respectively coupled to the network connections; and
controlling the peripheral devices based on the results of said step of interrogating the status of plural computers.

42. (Original) A method as recited in claim 41, wherein said step of interrogating the status of plural network connections comprises detecting a carrier on each network connection.

43. (Original) A method as recited in claim 41, wherein said step of interrogating the status of plural computers comprises using Packet Internet Groper.

44. (Original) A method as recited in claim 41, further comprising the step of maintaining a record of the status of each computer and each network connection in the control unit.

45. (Original) A method as recited in claim 41, further comprising the step of transferring status data between the computers at the direction of the control unit.

46. (Previously presented) A multiple port unit as recited in claim 1, wherein the interrogation is effected by the control unit sending a packet.

47. (Previously presented) A multiple port unit as recited in claim I, wherein the interrogation of the network links relates to whether a particular network link is working properly.

48. (Previously presented) A multiple port unit as recited in claim I, wherein the control unit being further configured to determine whether it is time to interrogate the network links includes a determination if a preset time for switching network links has elapsed.

49. (Previously presented) A multiple port unit as recited in claim I, wherein said control unit identifies a network link not operating properly based on the interrogation.

50. (Previously presented) A multiple port unit as recited in claim 49, wherein said control unit communicatively couples said communication serial ports to the selected one of said network ports to avoid the network link not operating properly.